EFFECTIVENESS OF THE INTERMITTENT LUMBAR TRACTION WITH 30% AND 60% BODY WEIGHT ON STRAIGHT LEG RAISE TEST OF SYMPTOMATIC PATIENTS WITH LUMBER SPONDYLOSIS WITH SCIATICA – A COMPARATIVE STUDY

By

(Reg. No . 27101803)

PADMAVATH COLLEGE OF PHYSIOTHERAPY

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(Reg. No . 27101803)

Under the guidance of

Mr. K. KUMAR , M.P.T. , MIAP.,

Associate Professor,

Padmavathi College of Physiotherapy

Submitted in Partial fulfillment of the requirements for the

Degree of **Master of Physiotherapy**

From

The Tamilnadu Dr. M.G.R. Medical University,

Chennai

PADMAVATH COLLEGE OF PHYSIOTHERAPY

PERIYANAHALLI

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CERTIFICATE

This is to certify that the project entitled **"EFFECTIVENESS OF THE INTERMITTENT LUMBAR TRACTION WITH 30% AND 60% BODY WEIGHT ON STRAIGHT LEG RAISE TEST OF SYMPTOMATIC PATIENTS WITH LUMBER SPONDYLOSIS WITH SCIATICA – A COMPARATIVE STUDY"**

Submitted by the candidate

(Reg. No . 27101803)

is a bonafide work done in partial fulfillment of the requirements for the Degree of **Master of Physiotherapy** from

The Tamilnadu Dr. M.G.R. Medical University,

Chennai

Guide **Principal**

Viva-voce Examination held on _____

Internal Examiner **External Examiner**

DECLARATION

I hereby declare and present my dissertation entitled entitled **"EFFECTIVENESS OF THE INTERMITTENT LUMBAR TRACTION WITH 30% AND 60% BODY WEIGHT ON STRAIGHT LEG RAISE TEST OF SYMPTOMATIC PATIENTS WITH LUMBER SPONDYLOSIS WITH SCIATICA – A COMPARATIVE STUDY"** the outcome of the original research work undertaken and carried out be me , under the guidance of **Mr. K. KUMAR, M.P.T. , MIAP.,** Associate Professor , Padmavathi College of Physiotherapy, Periyanahalli, Dharmapuri , Tamilnadu.

I also declare that the material of this dissertation had not formed in any basis for the award of any other Degree previously from the Tamilnadu Dr. M.G.R. Medical University, Chennai.

(LOLUCK PAUL . P)

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(LOLUCK PAUL . P)

DEDICATED TO MY BELOVED

PARENTS , STAFFS

AND

LOVABLE FRIENDS

TABLE OF CONTENTS

INTRODUCTION

Lumbar Spondylosis is the changes in the individual disc of the spine in any part of the spine. Degenerative Disc Disease refers to a syndrome in which a compromised disc causes low back pain.

Lumbar Spondylosis can affect any part of the spine although common sites are the lumbar (lower back) and cervical (neck) spine; thoracic degenerative disc disease is very uncommon. It is estimated that at least 30% of people aged 30-50 years old will have some degree of disc space degeneration, although not all will have pain or ever receive a formal diagnosis. In fact, after a patient reaches 60 years of age some level of disc degeneration is deemed to be normal finding, not the exception.

The process of the spine may lead to local pain. Stiffness and restricted activity.

Sciatica is a set of symptoms including pain that may be caused by general compression or irritation of one of nerve roots that give rise to the sciatic nerve. The pain is felt in the lower back, gluteals and various part of the leg and foot. In addition to pain which is sometimes serve there

may be numbness, muscular weakness, and difficult in moving or controlling the leg.

Nerve roots may be impinged upon or tethered by lesions, so that stretching the root causes pain. This should be tested by having the patient bend forward or by straight leg raising the extended leg of a supine patient to determine whether this action elicits pain in the leg, gluteals or back, and if so, at what angle from the horizontal, the pain occurs, the pain is usually worsened by dorsiflexion at ankle and relived by flexion of the knee and hip. Positive SLR results usually indicate L 5 or S 1 root irritation.

Spinal exercise, ultrasound, cryotherapy, TENS, spinal traction, etc. are certain physiotherapy treatments for low back pain.

Traction is used as a popular modality in the management of low back pain. As a result of traction, the range of vertebral distraction as reported varies from 0.3 mm to 4.0 mm. The maximum distraction reported is 20.mm.

There are two types of lumbar tractions :

- ❖ Continuous traction
- ❖ Intermittent traction

Though various protocols exist in the application of Intermittent Lumbar Traction. It varies due to patient factors and physiotherapist's perspective from country to country. The variable in treating with Intermittent Lumbar Traction are tension of traction applied, duration of traction period, number of days of application of traction etc, The current study was designed to analyze the effective traction tension to be applied with intermittent Lumbar Traction. Here two different traction tensions were based on the body weight of the patients and the effectiveness was compared.

STATEMENT OF STUDY

Effectiveness of the Intermittent Lumbar Traction with 30% and 60% body weight on straight leg raise test of symptomatic patients with Lumbar spondylosis with Sciatica – A Comparative Study.

AIM OF THE STUDY

To determine the effectiveness of intermittent Lumber Traction with two different amounts of force (30% and 60% of body weight) on pain free mobility of the lower extremity as measured by the straight leg raise (SLR) test.

NEED OF THE STUDY

To identify appropriate parameter of traction tension to be applied for treating a patient with Lumbar Spondylosis with sciatica with intermittent lumbar traction and thereby establish a suitable protocol for each patient depending on their body weight.

REVIEW OF LITERATURE

- PELLECCHIA G L, {1994} : Stated that lumber traction is commonly used to treat patients with back pain.
- KRAUSE M., et al {2000} : Concluded that traction is most likely to benefit patients with acute ridiculer pain.
- THOMAS F MESZAROS, et al {2000} : Indicated that traction applied in patients with 30% and 60% of their body weight improved mobility of the lower extremity during the SLR test.
- ANNETTE A HARTE, et al {2007} : Stated that traction is commonly used for the treatment of low back pain [LBP] predominantly with nerve root involvement, however its benefits remain to be established.
- MAJLESI JAVID, et al {2008} : Owing to its higher specificity, SLR test may especially help identify patients who have herniations with roots compression as concluded.
- DARREL S BRODKE, et al {2004} : in their study entitled non operative management of low back pain and lumbar disc degeneration, stated lumbar traction distract the lumbar vertebrae. Enlarges the intra vertebral foramen, creates a vacuum to reduce herniated disc, put tension on the posterior longitudinal ligament,

which aids in the reduction of herniated disc, and free adherent nerve roots.

Intradiscal pressure can be decreased by 20% to 30% with traction, but does not change the natural history of back pain.

- REUST P, et al {1988} : Traction therapy for low back pain with sciatica has been evaluated in a double blind study by 60 patient hospitalized for sciatica with signs of sensory or motor deficiency were randomized to 3 treatment groups, placebo traction {5kg}, light traction {15kg}, and normal traction {50kg}. Clinical evaluation after 4, 8, 12 traction sessions showed no difference between the three groups.
- PINAR BORMAN, et al {2003} The study conducted by with the aim of examining the deficiency of lumbar traction in the management of patients with low back pain concluded that no specific effect of traction was observed in their study.

DESIGN AND METHODOLOGY

RESEARCH DEDIGN

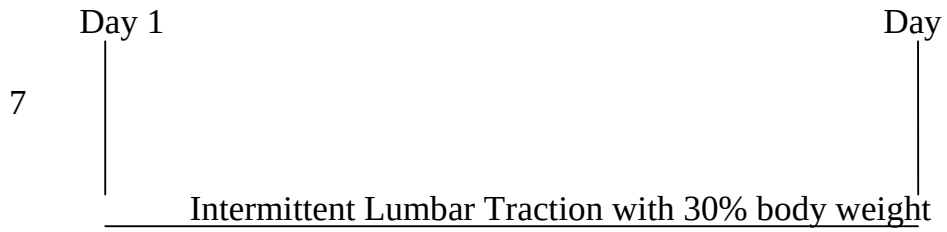
The study was experimental in nature. Twenty samples were selected using simple random sampling method and were further divided into two equal groups randomly.

Pre test assessment were taken for both group using SLR test.

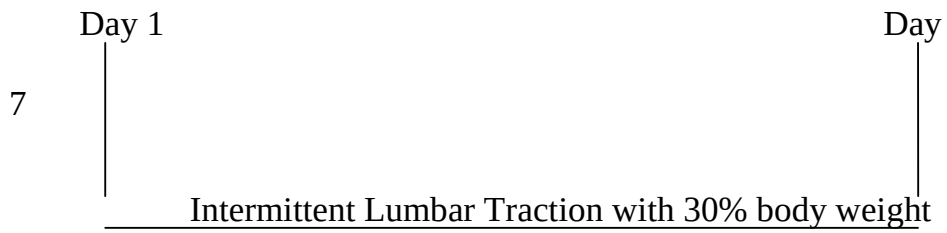
After pre test, the experimental group I receive intermittent lumbar traction with 30% body weight and experimental group II received intermittent lumbar traction with 60% body weight.

On the 7th day post test assessment was taken similar as pretest assessment.

Experimental Group I



Experimental Group II



CRITERIA FOR SELECTION

Inclusion Criteria

- Patients who were clinically and radiologically diagnosed to have Lumbar Spondylosis with sciatica with a positive unilateral SLR test below 45°
- Both male and female patients.
- Age group – patients with 50-65 years of age.

Exclusion Criteria

- Patients with acute radicular pain with concomitant neurological deficit.
- Other traumatic and mechanical back pain.

POPULATION

Patients who were clinically and radiologically diagnosed to have Lumbar Spondylosis with sciatica with a positive unilateral SLR test below 45°

SAMPLE SIZE AND METHOD OF SELECTION

20 Patients comparising of 10 patients in each group using simple random sampling technique.

VARIABLES OF THE STUDY

- Independent variable : Intermittent Lumbar Traction
- Dependent Variable : Straight leg raises (SLR)

VALIDITY AND RELIABILITY OF THE TOOL USED

SLR is the valid and reliable tool for assessing nerve root compression in any condition presenting with low back pain including Lumbar Spondylosis.

STUDY SETTING

The study was conducted in the department of Physiotherapy and Rehabilitation, Vinayaka Mission Hi-tech Hospital, Salem.

METHODOLOGY

The study was done with an objective to determine the effect of intermittent Lumbar traction with two different amount of force (30% and measured by the straight leg raise (SLR) test and the study was designed as a prospective clinical trial.

Patients attending the departments of Orthopedics and Physiotherapy in Vinayaka Mission Hi tech Hospital who were clinically and radiologically diagnosed to have Degenerative Disc Disease with sciatica with positive unilateral SLR test below 45° were taken as the study population. From this population, 20 patients were taken as the study sample. They were randomly divided into equal groups, each group receiving Intermittent Lumber Traction with 30% and 60% body weight respectively.

Each subject's consent was taken and objectives and method of study were explained to them. Pretreatment assessments were taken before the commencement of study which included SLR test.

The patient was made to supine position in a comfortable and relaxed manner. The investigator lifted the patient's non symptomatic extremity. The angle at which pain elicited during SLR test was noted

using goniometer and documented. These data were taken as the pretreatment score.

All the patients in whom pain elicited at or below 45° of SLR were treated with intermittent lumbar traction. Before positioning the patient in traction table, patient's body weight was measured using calibrated weighing machine and the data were documented. Patients who were Included in the first group, received intermittent lumbar traction in supine lying with a tension of 30% of their body weight, and the patients belong to the second group received intermittent lumbar traction with a tension of 60% of their body weight.

All the patients in both the groups received intermittent lumbar traction in supine lying with prescribed tension for a duration of 15 except in Sundays. All of them were given proper back care advises.
On the 7^{th} day of treatment assessment was taken same way as the pretreatment assessment and documented. This was taken as the post treatment scoring.

The obtained data were arranged, tabulated and analyzed using appropriate statistical tools.

OBSERVATION AND ANALYSIS

The collected data were subjected to paired ‘t’ test individually for experimental group – I and experimental group – II

EXPERIMENTAL GROUP – I

Table 1.1

Patient treated with ILT with 30% of their body weight

(Paired ‘t’ test)

Variable	‘t’ cal value	‘t’ table value
SLR	20.7	2.262

‘t’ calculated value > ‘t’ table value

- Significant at 5% level

EXPERIMENTAL GROUP – II

Table 1.2

Patient treated with ILT with 60% of their body weight

(Paired‘t’ test)

Variable	‘t’ cal value	‘t’ table value
SLR	29.11	2.262

‘t’ calculated value > ‘t’ table value

- Significant at 5% level

INDEPENDENT ‘t’ TEST

After the paired ‘t’ test, the data were subjected to independent ‘t’ test to analyze any significant difference in improvement between experimental group –I and experimental group – II

Variable	‘t’ cal value	‘t’ table value
SLR	3.44	2.101

Table ‘t’ value for degrees of freedom at 5% at 5% level of significance was taken.

‘t’ calculated value > ‘t’ table value

- Significant at 5% level

RESULTS AND DISCUSSION

RESULTS

During the analysis of data, it was found that found that both groups showed improvements in SLR but more significant improvement was evident in the experimental group – II where the 60% of body weight traction force was applied.

DISCUSSION

This study was designed in order to compare the effectiveness of intermittent lumbar traction with two different traction tensions (30% and 60% of body weight) in patients with lumbar spondylosis and the effectiveness was assessed with the SLR as the outcome measure.

Both experimental groups showed improvements in the SLR after 7 days of treatment with 30% and 60% of the body weight respectively. But the experimental group II treated with 60% of body weight showed more significant improved in the SLR.

Joint distraction reduces the compression on the joint surfaces and widens the intervertebral foramina, potentially reducing pressure on particular surfaces, or the spinal nerve roots. This joint distraction may

reduce pain originating from joint injury, or inflammation or from nerve root compression.

It has been proposed that the application of a traction force to the spine can cause distraction of the spinal apophyseal joints. For distraction to occur, the force applied must be great enough to cause to cause sufficient elongation of the soft tissues surrounding the joint to allow the joint surfaces to separate (Michelle H Cameron; Physical Agents in Rehabilitation – From Research to Practice).

Smaller amounts of force will increase the traction on, or elongate the soft tissues of spine without separating the joint surfaces. The traction force equal to 30% of body weight which was applied to the experimental group – I was only sufficient to increase the length of the lumbar spine. But the traction force equal to 60% of body weight applied in the experimental group – II could distract the lumbar zygapophyseal joints which produced the desired therapeutic effects. The larger lumbar joints, which have more and tougher surrounding soft tissues, required more force to achieve joint distraction.

RECOMMENDATIONS FOR FURTHER STUDY

Further study is needed to determine the optimal treatment duration, frequency and mode of administering the intermittent lumbar traction in Lumbar spondylosis with sciatica.

CONCLUSION

The result of the study make us to conclude that the traction force with 60% of body weight as the optimal method of treating lumbar spondylosis with sciatica by Intermittent lumbar Traction than the traction force with 30% of body weight.

REFERENCES

1. M. Krause, et al: Evaluation of effects and recommended application for treatment, Man Ther, 2000, Vol. 5, pages 72-81.
2. T F Measzaros, et al: Effect of 10%, 30% and 60% body weight traction on the straight leg raise test of symptomatic patients with low back pain, Journal of Orthopedic and Sports Physical Therapy, 2000, Vol-30, pages 595-061.
3. J A Mathews, J Hickling : Lumbar traction : a double – blind controlled study for sciatica, Rheumatol Rehbil, 1975, Vol-14, pages 222-5.
4. Annette A Harte, et al : Lumbar Traction : a review of the literature, BMC musculoskeletal disorders, 2007, 8:118.
5. Result P, et al: Traction therapy for low back pain, Schweiz Med Wochenschr, 1988, 27:118 (8) :271-4.
6. Pinar Borman., et al : The efficiency of lumbar traction in the management of patients with LBP, Rheumatology International 2003, Vol023:2.
7. Pellecchia G L : Lumbar traction ; a review of the literature, Journal of Orthopedics and Sports Physical Therapy, 1994, 20:262-7.

8. Michelle H. Cameron, Physical Agents in Rehabilitaion From Research to Practice. Second edition.
9. James A. Porerfield, Mechanical Low Back Pain, Perspectives in Functional Anatomy.
10. Gregory P. Grieve, Modern Manual Therapy of the vertebral column, 1986.

APPENDIX – I

PROFORMA

Date of Assessment :

Hospital No :

Name :

Age/Sex :

Address :

Occupation :

Diagnosis :

Body weight of the patient :

PRE TEST SLR		POST TEST SLR	
Date :		Date :	
Side :			

APPENDIX – II

EXPERIMENTAL GROUP – I

Patients treated with ILT with 30% of body weight

No	Body weight	Pre test	Post test
1.	60	34	46
2.	55	42	57
3.	72	40	57
4.	60	28	47
5.	68	44	59
6.	58	39	54
7.	55	44	61
8.	64	38	51
9.	60	32	46
10.	70	25	42

‘t’ cal value = 20.7

‘t’ table value = 2.262

EXPERIMENTAL GROUP – I

Patients treated with ILT with 30% of body weight

No	Body weight	Pre test	Post test
1.	60	34	46
2.	55	42	57
3.	72	40	57
4.	60	28	47
5.	68	44	59
6.	58	39	54
7.	55	44	61
8.	64	38	51
9.	60	32	46
10.	70	25	42

‘t’ cal value = 29.11

‘t’ table value = 2.262